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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,076	08/20/2004	William E. Bernier	FIS920040098US1	5075
29154	7590	06/30/2006	EXAMINER FARAHANI, DANA	
FREDERICK W. GIBB, III GIBB INTELLECTUAL PROPERTY LAW FIRM, LLC 2568-A RIVA ROAD SUITE 304 ANNAPOLIS, MD 21401			ART UNIT 2891	PAPER NUMBER

DATE MAILED: 06/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/711,076	<b>Applicant(s)</b> BERNIER ET AL.	
	<b>Examiner</b> Dana Farahani	<b>Art Unit</b> 2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 May 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,4-8,11-14 and 29-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4-8,11-14 and 29-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>8-20-04, 8-26-04</u> | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 4-8, 11-14, 29 and 31-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the phrase “numerous thermal excursions” makes the claims indefinite, as it is not clear how many thermal excursions are performed and what exactly a thermal excursion is (i.e. what temperature and duration is considered a thermal excursion). The following prior art rejections are based on the claims, insofar as they are understood.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 4-7 and 29-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et al., hereinafter Xu (US Patent 6,680,436) in view of Capote et al., hereinafter Capote (US Patent Application Publication 2005/0218517).

Regarding claim 1, Xu discloses, figures 2-4, a carrier 100;  
a device 200 connected to the carrier;

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solder connectors 250 connecting the device to the carrier;  
a compressible film 150 surrounding sides of the solder connectors, wherein the compressible film has sufficient compressibility to accommodate expansion of the solder bumps when they are melted (see col. 3, lines 66-67; and col. 4, lines 1-11).

Xu does not disclose an insulating material filling gaps between the carrier and the device.

Capote discloses in figure 18, insulators 38 and 40 are between a carrier and device, along with the film 42. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to place insulators between the carrier and device of the Xu reference, to further provide mechanical strength for the package.

Regarding claim 4, the compressible film forms a pattern between the carrier and the device, as can be seen in the figures.

Regarding claim 5, see the cited figure of Capote reference, wherein said insulator films are formed in channels.

Regarding claim 6, the pattern in the Xu reference would comprise diagonal strips of said compressible film, due to difference in thermal coefficient expansion of the substrate 100 and chip 200, as evidenced in figures 16 and 17 of the Capote reference, and paragraph 146 therein.

Regarding claim 7, the pattern of the compressible film in combination with the insulator material, figure 18 of the Capote reference, comprises rectangles of the compressible film, as can be seen in that figure.

Regarding claims 29 and 31-35, Xu in view of Capote discloses the limitations in these claims (see above). Also, the encapsulant of the Xu's structure could be said to be rubbers, since

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rubber is defined as materials that have elastic properties similar to that of natural rubber; and the encapsulant comprises epoxy (see col. 4, lines 59-61).

5. Claims 8 and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu in view of Capote and further in view of Applicant's Admitted Prior Art (AAPA).

Xu in view of Capote, renders obvious the claimed invention, as discussed above, except for disclosing that the solder joints are lead free.

AAPA discloses in paragraph 6 of the instant application, that lead free solders are known in the art and are environment friendly. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use lead free solders in the structure of Xu in view Capote in order to protect the environment form harmful lead contamination.


### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (571)272-1706. The examiner can normally be reached on M-F 9:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on (571)272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

D. Farahani



**B. WILLIAM BAUMEISTER**  
**SUPERVISORY PATENT EXAMINER**